The Irrational Beliefs Inventory (IBI)

Koopmans, P.C.; Sanderman, R.; Timmerman, I.; Emmelkamp, P.M.G.

Published in:
European Journal of Psychological Assessment

Publication date:
1994

The Irrational Beliefs Inventory (IBI): Development and Psychometric Evaluation

Petra C. Koopmans, Robbert Sanderman, Irma Timmerman and Paul M.G. Emmelkamp

University of Groningen, The Netherlands

Keywords: Irratinoal beliefs, psychometrics, assessment, psychological distress, personality

This article describes the development and validity testing of the Irrational Beliefs Inventory (IBI), a measure of irrational beliefs derived from the Rational Behaviour Inventory (RBI) and the Irrational Beliefs Test (IBT). In the first Study, these questionnaires were administered to clinical (N = 74) and non-clinical subjects (N = 231). The itempool, consisting of 137 items, was factor analyzed followed by Varimax rotation. Five factors emerged: Problem Avoidance, Rigidity, Worrying, Need for Approval and Emotional Irresponsibility. The first version of the IBI contained 63 items (IBI-63). Associations among the factors were low. Reliabilities of the subscales and the total IBI scale were moderate to high.

Subsequently, in a second Study, the IBI-63, together with several other questionnaires, was administered to 485 subjects from a normal population. Confirmatory and exploratory factor analyses were carried out. The five factors were approximated reasonably well by the new factor structure. A number of items were deleted because of content or low factor loading. The final version of the IBI contains 50 items. Reliability of the subscales (range α = .70–.85) and the total IBI-50 scale (α = .85) was satisfactory. Associations among the subscales were low to moderate. In order to determine the construct validity of the IBI, its subscales were correlated with the scales of the *Eysenck Personality Questionnaire* (EPQ), the *General Health Questionnaire* (GHQ) and the *Social Cognition Inventory* (SCI). Further, it was addressed whether the relationships between the IBI and the remaining measures were a function of Neuroticism. In the third Study the IBI-50 was administered to 536 students. Factor analytic results, reliability and correlations with the EPQ and GHQ and the *Scale for Interpersonal Behaviour* (SIB) largely substantiated the results of Study 2.

The last 20 years there has been an increased interest in the role of irrational cognitions in the development and maintenance of emotional disturbances. Irrational cognitions can be conceived as irrealistic verbal reasoning processes by which external events are interpreted and through which emotional distress is mediated. Since Ellis' formulation of ten basic irrational beliefs (Ellis, 1962), presumed to be related to emotional distress, a variety of instruments have been developed to measure irrational beliefs, the *Irrational Beliefs Test* (IBT; Jones, 1968) and the *Rational Behaviour Inventory* (RBI; Shorkey & Whiteman, 1977) being the most widely employed.

Notwithstanding this widespread use of the IBT and the RBI little is known about the factorial validity of these instruments. Factor replication studies showed that the factor structures of these instruments were only moderately congruent with the original patterns. Lohr & Bonge (1982) could not replicate the subscale "Frustration Reactive" of the IBT. Moreover, only half of the items of the remaining subscales loaded highly on the matching components, with the exception of the items of the subscale "Demand for Approval", which loaded all highly on its respective component (Lohr & Bonge, 1982). Himle, Hnat, Thyer & Papsdorf (1985) found nine of the eleven RBI factors to be reasonably well approximated by their data. Two factors were combined into one factor, two new factors emerged and the factor "Control of Emotions" was not retained. Psychometric characteristics of these instruments have been subjected to criticism. Particularly the low to moderate reliabilities of the subscales of the IBT (range α = .35–.73; Lohr & Bonge, 1982) and the RBI (range α = –.01–.76; Sanderman, Mersch, van der Sleen, Emmelkamp & Ormel, 1987) precludes the use of these subscales.

In short, the two most popular measures of irrational beliefs contain numerous psychometric in-

adequacies. The purpose of the present Study was to develop a more reliable and valid instrument for assessing irrational beliefs, based on the itempool of the RBI and the IBT. Although there were other instruments available (like the *Dysfunctional Attitude Scale and the Self-Inventory*) we chose to base our research efforts on the IBT and the RBI. We have reasoned that the instruments together would cover the domain of irrational beliefs satisfactory. Material was collected in two community samples, one student sample and one clinical sample. The construct validity of the new instrument was assessed by correlating its subscales to other scales measuring emotional distress and personality. Zurawski and Smith (1987) have argued that irrational beliefs scales often measure negative affect or Neuroticism rather than irrational cognitions. Given that irrational beliefs are theorized to mediate the arousal of distress and negative affect, any valid measure of irrational beliefs must be distinguishable from negative affect in order to be empirically useful. Therefore it should be demonstrated that convergent correlations remain significant after the common influence of Neuroticism is statistically controlled.

STUDY 1

Method

Subjects

The subject sample ($N = 305$) was composed of two groups:

1. A randomly selected Dutch community sample ($N = 231$). All subjects completed a mailed survey questionnaire on cognitive factors and its correlates (Sanderman et al., 1987). The sample consisted of 111 men and 120 women. Mean age of the subjects in this sample was 42.7 years (SD = 13.1; range, 20–69 yr).
2. Patients ($N = 74$) who applied for treatment of social phobia at the department of Clinical Psychology (Sanderman et al., 1987). All subjects met the DSM-III criteria (American Psychiatric Association, 1980) for social phobia. The sample consisted of 33 men and 41 women. Mean age was 32.1 years (SD = 8.9; range, 18–56 yr).

Measures

The subjects completed the following inventories:

1. *The Irrational Beliefs Test* (IBT; Jones, 1968) is a questionnaire developed to assess irrational beliefs based on ten basic irrational beliefs as formulated by Ellis (1962). The 10 subscales, all containing 10 items, are: (a) demand for approval, (b) high self expectations, (c) blame proneness, (d) frustration reactive, (e) emotional irresponsibility, (f) anxious overconcern, (g) dependency, (h) problem avoidance, (i) helplessness for change, and (j) perfectionism. A high score reflects more irrational thinking, a low score represents rationality.
2. *The Rational Behaviour Inventory* (RBI; Shorkey & Whiteman, 1977) is also a self-report irrational beliefs inventory. The RBI consists of 37 items, which are subdivided into the following 11 subscales: (a) catastrophizing, (b) guilt, (c) perfection, (d) locus of control, (e) demand for caring, (f) blame/punishment, (g) inertia/ avoidance, (h) independence, (i) downing self and others, (j) possible future misfortune, and (k) control of emotions. A high score on the RBI reflects rationality, while a low score indicates that the person endorses more irrational beliefs.

Procedure

The initial pool of items consisted of 137 items: 100 IBT- and 37 RBI-items. The questionnaires were completed in their original formats. The respondents were asked to indicate for each item whether he or she strongly agreed, agreed, was neutral, disagreed, or strongly disagreed with the contents of the item. The raw item scores (range, 1–5) were used in the statistical analyses.

After the items had been factor analyzed by principal components analysis, the resulting factors were rotated using the Varimax procedure. The optimal number of factors was established by two criteria: (a) Eigenvalues of the factors should be greater than 1, and (b) extra percentage explained variance by added factors.

Additional guidelines in the construction of the questionnaire were the following: first, subscales should consist of at least 6 items, to prevent elimination of such a scale with cross-validation; second, the criterion for inclusion of an item into a factor was a minimum loading of .35 in the initial analyses and .40 in the later analyses; third, it was aimed to construct subscales with a reliability – following Cronbach's alpha – of greater than, or equal to, .70; fourth, when an item loaded highly (i.e., .35 in the first or .40 in the replication) on two or more factors, the absolute difference between two factor loadings should be minimaly .10 in order to assign an item to the respective factor. If this criterion was not met,

the item was assigned to a factor based on content; and if this was not possible, the item was eliminated; fifth, in some cases a criterion could be overruled after considering the content of an item in relation to the scale.

Results and Discussion

Factor Analysis

At first a rough selection of items was made by eliminating 41 items which loaded lower than .35 on all factors of at least 3 of the 5 factor solutions (consisting of 2,3,4,5 and 6 factors respectively). Factor analyses followed by Varimax rotation on the remaining 96 items (65 IBT- and 31 RBI-items) were carried out. Since a criterion was that subscales should contain more than 5 items, and the sixth factor contained only 5 items, the five factor solution was sustained for further analyses (Eigenvalues: 16.08, 8.83, 3.93, 2.80, 2.52, 2.30). Inspection of the 5-factor solution revealed that 7 items loaded lower than .35 on all 5 factors. These items were excluded from further analyses. Twenty-three items had factor loadings ≥.35 on two factors. Eight of these items were assigned to a factor based on the criterion of a .10 difference between the factor loadings; the remaining items were eliminated.

Factor analysis followed by Varimax rotation was carried out on the remaining 74 items (50 IBT- and 24 RBI-items). The resulting 5 factors explained 36.3% of the total variance. When the criterion for the factor loading of an item was raised from .35 to .40, twelve items did not met this criterion and were eliminated. Two items loaded higher than .40 on two factors and were assigned to one of the two factors based on content. Of three items it was questionable whether the content really reflected irrational cognitions and these items were therefore excluded from further analyses. Fifty-nine items remained (40 IBT- and 19 RBI-items).

The five factors were:

1. *Problem Avoidance* (i = 16; α = .86). This factor is defined by items that reflect irrational cognitions concerning making decisions, taking risks and taking responsibility. People who have a high score on this factor hold that it is easier to avoid difficulties and problems than to face them. They hold they are dependent on others with regard to taking decisions and risks.
2. *Rigidity*. (i = 17; α = .85). This factor deals with rigid thoughts and norms people hold for themselves and for others. A high score reveals feelings of guilt and attribution of guilt, punishment and blame for mistakes, sins or deviations from strict values and norms.
3. *Worrying*. (i = 11; α = .84) This factor reflects worrying over possible misfortune and possible future accidents.
4. *Need for Approval*. (i = 8; α = .78). This factor clusters thoughts about being in need for approval of others and reflects fear of not being accepted and respected by others or fear of failing in front of other people.
5. *Emotional Irresponsibility*. (i = 7; α = .64). This factor deals with ascribing emotions to external causes instead of to oneself.

The inventory has a total score consisting of the sum of the 5 factors, which reflects a person's total irrationality score.

Except for Emotional Irresponsibility, reliabilities of all subscales and the total scale were satisfactory. The reliability of the total scale (α = .87) was slightly higher than the reliability of the RBI (α = .82) and comparable to the reliability of the IBT (α = .88).

To raise the reliability of the subscale Emotional Irresponsibility (α = .64) four items originating from the IBT scale Emotional Irresponsibility were added to this subscale. These items loaded between .30 and .40 on this factor in the initial analyses. The reliability of the subscale Emotional Irresponsibility after the extension of the scale was .71; the reliability of the total scale did not change.

The questionnaire developed in this Study contained 63 items and was named Irrational Beliefs Inventory (IBI-63). The 5 factors together explained 37.9% of the total variance.

Correlations among the IBI-Subscales

The correlations among the IBI subscales and the total scale are shown in Table 1.

The subscales were moderately independent of each other. Rigidity and Emotional Irresponsibility were found to be correlated negatively ($r = -.35$), pointing to lower rigidity-scores to be associated with higher Emotional Irresponsibility-scores. Problem Avoidance, Worrying and Need for Approval were found to be associated moderately positively with each other (range $r = .43–.52$). A possible explanation for this association is that all of these scales contain different elements of anxiety, i. e., fear of responsibility, possible future misfortune and losing affirmation of others respectively. It is possible that the measure of irrational beliefs developed in this Study is contaminated by Neuroticism. To investigate the distinct nature of cognitive and emo-

Table 1. Correlations among the IBI subscales and the IBI total scale (Study 1).

Scale	α	1	2	3	4	5
1 Problem Avoidance	.86	–				
2 Rigidity	.85	.12	–			
3 Worrying	.84	.43	−.14	–		
4 Need for Approval	.78	.52	−.04	.46	–	
5 Emotional Irresponsibility	.71	.15	−.35	.46	.19	–
Total	.87	.80	. 33	.72	.66	.40

Note. Correlations equal to or higher than .15 are significant at $p < .01$

tional constructs, in the next Study the factor structure of the IBI was cross-validated and the construct validity was studied.

STUDY 2

Method

Subjects

Subjects belonged to a randomly selected Dutch community sample (Sanderman, Eysenck & Arrindell, 1991). A part of this sample ($N = 654$) volunteered to participate in further research and was send a questionnaire designed to investigate psychological complaints and cognitive factors. Response percentage was 74% ($N = 485$). The sample consisted of 249 men and 200 women (information on gender of 36 persons was missing). Mean age of the subjects was 42.3 years ($SD = 14.7$; range, 20–71).

Measures

The following measures were employed:

1. *The Irrational Beliefs Inventory* (IBI-63), developed in Study 1.
2. *The General Health Questionnaire* (GHQ) (Goldberg and Williams, 1988), a 28-item questionnaire (cf. Sanderman & Stewart, 1990), measuring mental and physical well-being during the past 4 weeks. The questionnaire contains a total score and the following four subscales: 1) Severe Depression, 2) Anxiety/Insomnia, 3) Social Dysfunction and 4) Somatisation. For all scales higher scores indicate worse mental and physical well-being than lower scores.
3. *The Eysenck Personality Questionnaire* (EPQ) (Eysenck and Eysenck, 1975; Sanderman, Eysenck & Arrindell, 1991), a 101-item questionnaire, consisting of 4 scales: 1) Extraversion, 2) Neuroticism, 3) Psychoticism and 4) Social Desirability.
4. *The Social Cognition Inventory* (SCI) (Van Kamp and Klip, 1981), a Dutch questionnaire measuring cognitive aspects of unassertiveness in interpersonal situations. The questionnaire contains 35 items and consists of two scales: 1) Expectations and demands (in general) with regard to social situations and 2) Self-image and ideas about one's own social functioning. Summation of all items gives a general measure for irrational cognitions related to social situations. Irrational cognitions are reflected by low scores. The questionnaire possesses a high internal consistency (Van Kamp and Klip, 1981) and discriminates between shy people and "normals" (Van Meijgaard, Tros, van der Molen and Wolters, 1987).

Procedure

Item scores of the IBI (range 1–5) were analyzed using a computer program (PEKON), designed to measure strength of recurrence of defined factors in a new population (Camstra, 1985). Input for PEKON consists of the correlation matrix of the items in the new population and the rotated factor loading matrix of the items in the old population. Output can be interpreted in terms of percentage explained variance by the factors in the new population. According to Ten Berge (1986) a factor should explain minimally $(1/k) \times 100\%$ of the total variance (k = number of items). In the case of 63 items the explained variance by one factor should be minimally 1.6%.

In order to determine the construct validity of the IBI its scales were correlated with the scales of the other questionnaires as described above. To determine the distinct nature of cognitive and emotional measures, the analysis was repeated using partial correlation to remove the effect of Neuroticism.

Hypotheses

Prior to the analysis the following expectations were formulated concerning the correlations between the

Table 2. Correlations among the IBI factors (PEKON) in Study 2 and percentage of explained variance of the rotated factors in Study 1 and Study 2.

Factor	1	2	3	4	% expl. var. Study 1	Study 2
1 Problem Avoidance	–				9.7	7.5
2 Rigidity	.13	–			9.6	8.6
3 Worrying	.09	.19	–		7.8	8.2
4 Need for Approval	–.04	.07	.04	–	5.5	5.0
5 Emotional Irresponsibility	–.25	–.12	–.08	–.07	5.2	5.4
Total	–	–	–	–	37.9	32.5

IBI-scales and the scales of the other questionnaires:

All IBI scales are expected to be (highly) positive correlated with Anxiety, Depression and Social Dysfunction as measured by the GHQ and with the Neuroticism scale of the EPQ. The Rigidity scale of the IBI however is expected to show no relation with the Anxiety scale.

Further, all scales but the Rigidity scale of the IBI are expected to demonstrate (highly) negative correlations with the SCI scales. With respect to the Rigidity scale no expectations were formulated.

No expectations about the correlations between the total score of the IBI and the other measures were formulated.

Finally, all scales of the IBI are expected not to be correlated with the Social Desirability scale of the EPQ.

Results and Discussion

Cross-Validation

Results of the cross-validation of component weights across populations and the percentage of explained variance of the factors are described in Table 2.

Table 2 shows that the correlations among the factors in the new material were low. This means that the factors recurred independently of each other in Study 2. The factors Problem Avoidance, Rigidity and Demand for Approval explained slightly less variance in this Study than in Study 1. The 5 factors together also explained 5.4% less variance in Study 2 than in Study 1. Probably, the cross-validation procedure accounts for less variance due to shrinkage. The separate factors explained more variance than the criterion of 1.6% so the 5 factor solution was sustained. Since some of the items loaded highly on other factors than they were assigned to in Study 1, we decided to conduct further exploratory factor analysis.

Exploratory Factor Analysis

The IBI-63 was subjected to exploratory factor analysis, followed by Varimax rotation. The criteria for item selection were the same as in Study 1, except that the absolute difference between two factor loadings of an item should now be minimally .15 instead of .10 in order to assign an item to a factor.

The resulting 5 factors explained 33.5% of the total variance. Ten items were removed: nine because of the criterion that the factor loading should be larger than .35 and one because of a factor loading in the opposite direction. Eight items had high factor loadings on two factors and were assigned to a factor: half of the items were based on the criterion that the difference between factor loadings of the same item should be larger than .15 and half were based on the content of the item.

The remaining 53 items were factor analyzed. Five factors together explained 36.9% of the total variance. Now the criterion for inclusion of an item into a factor was raised to a minimum factor loading of .40, as was done in Study 1. Three items did not meet this criterion and were removed.

The resulting version of the IBI contained 50 items and 5 factors. Summing across all items gives a total score, which can be conceived as a general indicator of the level of irrational thinking.

Reliability and Correlations among the IBI-Subscales

Reliability in terms of Cronbach's alpha for the subscales and the total test of the IBI-50 is depicted in Table 3 (See Appendix A for items of the final scale).

Reliabilities of the subscales Worrying and Rigidity and the total test were satisfactory, as is shown in Table 3. Reliabilities of the scales Emotional Irresponsibility, Need for Approval and Problem Avoidance however were moderate, but higher than the criterion of .70. The subscales were found to correlate lowly to moderately with one another as

Table 3. Correlations among the IBI subscales and the total IBI scale and reliability coefficients (Study 2).

Scale	# of items	α	1	2	3	4	5
1 Worrying	(12)	.85	–				
2 Rigidity	(14)	.81	.23	–			
3 Need for Approval	(7)	.75	.44	.09	–		
4 Problem Avoidance	(10)	.70	.37	.23	.32	–	
5 Emotional Irresponsibility	(7)	.72	.16	–.26	.10	–.12	–
Total	(50)	.85	.82	.57	.61	.57	.24

Note. Correlations equal to or higher than .11 are significant at $p < .01$

shown in Table 3. All correlations were in the same direction as in Study 1. The subscales Problem Avoidance, Worrying and Need for Approval were found to correlate moderately with each other (range $r = .32–.44$), probably because all three scales contain an element of anxiety. Rigidity was negatively correlated to Emotional Irresponsibility ($r = -.26$). This means that as irrational cognitions with regard to rigid norms and standards increase, external attributions of emotions and feeling decrease.

Comparison of the IBI-50 with the IBT and the RBI

Comparison of the IBI-50 with the IBT and the RBI respectively shows that some of the IBT- and RBI subscales were represented totally or partly by the IBI scales. The IBI scale Worrying consists among others of 6 items from the IBT scale Anxious Overconcern and 3 items from the RBI scale Catastrophizing. The IBI scale Rigidity consists of items from several subscales, among which are 4 items from the IBT scale Blame Proneness and 3 items from both the subscale Guilt and the scale Blame/Punishment of the RBI. The Problem Avoidance scale of the IBI contains, among others, 4 items from the corresponding IBT scale Problem Avoidance and 3 items from the RBI scale Inertia/Avoidance. The IBI scale Need for Approval consists largely of 5 items from the IBT scale Demand for Approval. The Emotional Irresponsibility scale of the IBT consists of 7 items from the similar Emotional Irresponsibility scale of the IBT.

The IBT subscales Dependency and Helplessness for Change as well as the RBI scales Independence, Downing Self and Others and Control of Emotions were not represented by the IBI.

Correlations Between the IBI and Other Measures

Table 4 presents the results of the correlational analyses between all IBI scales and the scales from the SCI, GHQ and EPQ.

Generally all hypotheses concerning the correlations between IBI scales and measures of emotional distress are confirmed, with some exceptions. The results are described in more detail below.

Depression, Anxiety and Neuroticism were found to be relatively strongly related to Worrying, Need for Approval and Problem Avoidance, thus corroborating results from studies with RBI and IBT scales (Nelson, 1977; Morelli & Andrews, 1980; Deffenbacher, Zwemer, Whisman, Hill & Sloan, 1986).

The Rigidity scale of the IBI appears not to be correlated with Depression and Social Dysfunction of the GHQ. Morelli and Andrews (1980) found rigidity to be positively related to Neuroticism. This relationship was not found in the present Study.

No expectations were formulated with regard to the correlations between Rigidity and the SCI-scales. Rigidity shows no relation with the SCI-scale "Self-image and Ideas about own Social Functioning", but the scale was found to be significantly highly negatively correlated with "Expectations and Demands with regard to Social Situations" ($r = -.52$). This could mean that unassertiveness is more related to rigid

Table 4. Correlations between IBI-scales and other measures of psychopathology (study 2).

IBI-50 Problem Emotional Need for Rigidity

Table 5. T-tests between mean scores of men and women on all IBI scales (Study 2).

IBI Scale	Mean women	Mean men	Sd women	Sd men	T	df	p
Worrying	35.7	32.6	7.9	8.7	3.9	424	.000
Rigidity	43.5	44.2	7.4	8.7	–1.0	424	ns
Need Approval	20.5	19.6	4.4	4.2	2.2	439	.026
Problem Avoidance	22.4	22.7	4.3	5.0	–0.8	436	ns
Emotional Irres.	21.5	20.5	4.4	4.3	2.4	436	.017
Total IBI-scale	143.3	139.2	16.4	18.5	2.3	396	.020

Table 4. Correlations between IBI-scales and other measures of psychopathology (study 2).

Measures	Worrying		Rigidity		Need for Approval		Emotional Irrespons.		Problem Avoidance		IBI-50	
SCI												
- General	-.17*	(-.09)	-.52*	(-.48*)	-.26*	(-.27*)	.22*	(.20*)	-.33*	(-.27*)	-.38	(-.39*)
- Self	.37*	(-.04)	.00	(.06)	-.33*	(-.19*)	-.08	(-.02)	-.33*	(-.23*)	-.37*	(-.11*)
- Total	-.36*	(-.08)	-.32*	(-.26*)	-.38*	(-.29*)	.08	(.12)	-.42*	(-.32*)	-.48*	(-.32*)
GHQ												
- Somatisation	.35*	(.03)	.04	(.04)	.23*	(-.02)	.11*	(.07)	.18*	(.01)	.29*	(.05)
- Anxiety/Insomnia	.44*	(.03)	.03	(.00)	.29*	(.04)	.09*	(.03)	.24*	(.06)	.38*	(.05)
- Social Dysfunction	.25*	(-.03)	.07	(.05)	.20*	(.05)	.04	(-.01)	.30*	(.14*)	.28*	(.06)
- Severe Depression	.35*	(.00)	.01	(-.05)	.18*	(-.03)	.01	(-.04)	.27*	(.14*)	.29*	(-.00)
- Total	.42*	(.01)	.04	(.01)	.27*	(.01)	.08*	(.02)	.30*	(.10)	.37*	(.05)
EPQ												
- Psychoticism	-.05	(-.10*)	.00	(-.03)	-.02	(-.02)	-.17*	(-.18*)	.19*	(.17*)	-.04	(-.07)
- Extraversion	-.25*	(-.12*)	-.01	(-.00)	-.14*	(-.05	-.05	(-.05)	-.27*	(-.18*)	-.25*	(-.14*)
- Neuroticism	.73*		.09		.42*		.10*		.37*		.61*	
- Social Desirability	.09*	(.20*)	.34*	(.30*)	-.09*	(-.06)	-.02	(.03)	-.02	(.00)	.15*	(.24*)

* significant ($p < 0.05$)
Note: partial correlations in ( ).

values and norms one holds about social functioning in general or about how one should behave in social situations, than to rigid values and norms one holds about one's own social functioning.

The correlations between Emotional Irresponsibility and the scales of the other questionnaires appear to be very low, notwithstanding the fact that some correlations are statistically significant. These results do not support the expectations, but are in line with the findings from several other studies indicating that Emotional Irresponsibility shows no relation with psychopathology (Cash, 1984; McLennan, 1987; Nelson, 1977).

Though it was expected that none of the IBI scales would show significant correlations with the Social Desirability scale of the EPQ, three of them appear to do so. Worrying and Need for Approval are however so low correlated with Social Desirability ($r = .09$, respectively $r = -.09$), that the influence of social desirability on these scales is negligible. The significant positive correlation between Rigidity and Social Desirability, on the other hand, is somewhat higher ($r = .34$). A possible explanation for this relationship is that people who hold rigid values and norms for themselves and others are inclined to show the best part of themselves, "as it is appropriate or as it should be".

The correlations between the total-score of the IBI and the other scales, are shown Table 4. The total scale of the IBI is found to be significantly correlated with all scales of all questionnaires. An exception is the correlation with the Psychoticism scale of the EPQ. The total-score of the IBI shows the highest correlation with the Neuroticism scale of the EPQ ($r = .61$).

An important theoretical question is whether the IBI scales measure irrational beliefs or emotional distress. To address this issue, partial correlations between the IBI scales and the scales of the scales of the other questionnaires were calculated with Neuroticism (EPQ) as intervening variable representing emotional distress. The results of the analysis are also presented in Table 4. After the influence of Neuroticism on the correlations between the IBI scales and the other scales was eliminated, most correlations appeared to be much lower than before. Results show that most correlations between IBI scales and SCI scales are relatively unaffected by emotional distress, except the correlations with the Worrying scale of the IBI. The correlations between IBI scales and GHQ scales are much smaller when the influence of Neuroticism was eliminated.

Age and Sex Differences

Only small correlations were found between Age and the total scale ($r = .17$), Worrying ($r = .12$), Need for Approval ($r = -.06$), Problem Avoidance ($r = .15$) and Emotional Irresponsibility ($r = -.17$); only the relationship between Age and Rigidity was more substantial ($r = .32$).

A significant Sex difference was found on 3 out of 5 subscales and on the total scale score. Results are presented in Table 5 (see page 20).

STUDY 3

Method

Subjects

Subjects who participated in this Study (N = 538) belonged to a randomly selected University student sample. A booklet with questionnaires was sent to their home address. Response was 55% and the sample consisted of 227 men and 307 women (from 4 of them sex was unknown). Mean age of the subjects was 23 years (Sd = 5.2).

Measures

Most of the measures employed have been described in Study 2, i. e., (a) The Irrational Beliefs Inventory (The version developed in Study 2. This version is printed in the Appendix. Note that in the current research a Dutch version has been used), (b) the General Health Questionnaire (28-item version) and (c) the Eysenck Personality Questionnaire. In addition the *Scale for Interpersonal Behaviour* (e. g., Arrindell & Van der Ende, 1985; Arrindell, Sanderman, Hageman, Pickersgill, Kwee, Molen, Lingsma, 1990) has been filled in by the subjects. Forty-six out of 50 of the items of the SIB are classified (in a non-overlapping fashion) into four categories of assertive behaviour. The respondent evaluates each item on two separate 5-point scales, one for discomfort and one for probability of engaging in a specific assertive behaviour. For present purposes we only used the discomfort scales. The dimensions are:

1. *Display of negative emotions (NEGS)*: requesting change in a person's irritating behaviour; standing up for one's rights in a public situation.
2. *Expression of and dealing with personal limitations (ONZS)*: admitting ignorance about a topic; recognition of one's failure or shortcomings; ability to deal with criticism and pressure; requesting help and attention.
3. *Initiating assertiveness (KENS)*: expressing one's own opinion.
4. *Expression of positive feelings or positive assertion (POSS)*: giving and receiving praise or compliments; display of feelings.

In addition, a summation of the scales gives a General assertiveness scale which indicates the level of assertiveness across various situations and various types of assertive behaviour.

Results and Discussion

Exploratory Factor Analysis

A principal component analysis has been carried out following the varimax criterion. A five factor solution has been forced to see if the former constructed IBI-50 with five subscales could be retrieved. Inspection of the rotated factor loading matrix showed that the items are loading very well on their respective factors. All items of the Demand of Approval and Emotional Irresponsibility scale had loadings higher than .40. Of the Worrying scale 11 out of 12 items had loadings equal to or higher than .40 on their respective factor (one item had a loading of .34). Of the Problem Avoidance items 9 out of 10 loaded higher than .40 on their respective factor. The results of the Rigidity factor were less clear cut. Though 9 out 13 loaded higher than .40 on the factor they belonged to 4 items had lower figures; i. e., between .13 and .33. Almost all items of the IBI loaded high on their respective factor with very low loadings (<.20) on dissimilar factors and 50% of the items had loadings equal to or higher than .60.

Reliability and Correlations among the IBI-Subscales

Reliabilities following Cronbach's alpha (see Table 6) are quite satisfactory. When we compare the results of this Study with Study 2 we can observe identical alpha coefficients on the following scales: Worrying, Problem Avoidance and Emotional Irresponsibility. There is a marked drop on the Rigidity scale (from .81 to .71) and a marked increase of the alpha coefficient on the Need for Approval scale. It might be recalled that Need for Approval is higher among younger women and that Rigidity is linked to age. We assume that large differences between the samples regarding educational training and age are contributing to these very differences.

Although the intercorrelations of the IBI-50 subscales show a quite similar pattern when compared to the results from Study 2 there are some

Table 6. Correlations among the IBI subscales and the total IBI scale and reliablity coefficients (Study 3).

Scale	α	1	2	3	4	5
1 Worrying	.84	–				
2 Rigidity	.71	.16	–			
3 Need for approval	.80	.45	.14	–		
4 Problem avoidance	.73	.25	.09	.19	–	
5 Emotional Irresponsibility	.72	.15	–.06	.03	–.07	–
Total IBI-scale	.83	.79	.51	.64	.49	.31

Note. Correlations equal to or higher than .13 are significant at $p < .01$

Table 7. Pearsonian correlations and partial correlations (controlled for Neuroticism) between IBI-scales and SIB, GHQ and EPQ (Study 3)

Measures	I		II		III		IV		V		VI	
SIB												
- NEGS	.35*	(.09*)	.02	(–.00)	.43*	(.27*)	.02	(–.04)	.25*	(.14*)	.39*	(.16*)
- ONZS	.36*	(.11*)	.07	(.04)	.37*	(.23*)	–.05	(–.06)	.31*	(.23*)	.40*	(.20*)
- KENS	.37*	(.15*)	.04	(.03)	.41*	(.28*)	.01	(–.00)	.28*	(.19*)	.40*	(.24*)
- POSS	.26*	(.05)	.08*	(.06)	.33*	(.24*)	–.01	(–.05)	.20*	(.10*)	.45*	(.15*)
- Total	.39*	(.12*)	.06	(.04)	.47*	(.31*)	–.01	(–.05)	.30*	(.15*)	.45*	(.22*)
GHQ												
- Somatization	.41*	(.12*)	.02	(.02)	.21*	(.02)	.03	(.00)	.10*	(–.02)	.31*	(.05)
- Anxiety/Insomnia	.50*	(.20*)	.07	(.11*)	.30*	(.11*)	.08*	(–.02)	.15*	(–.04)	.42*	(.18*)
- Social Dysfunction	.25*	(.02)	.05	(.03)	.14*	(.02)	.06	(.01)	.20*	(.15*)	.25*	(.08*)
- Severe Depression	.51*	(.16*)	.07	(.05)	.32*	(.10*)	.01	(–.08*)	.22*	(.09*)	.44*	(.13*)
- Total	.53*	(.17*)	.07	(.07)	.31*	(.08*)	.05	(–.03*)	.20*	(.08*)	.45*	(.15*)
EPQ												
- Psychoticism	–.04	(–.09*)	–.25*	(–.28*)	–.17*	(–.22*)	–.11*	(–.11*)	.09*	(.08*)	–.17*	(–.25*)
- Extraversion	–.22*	(–.08*)	–.04	(–.02)	–.16*	(–.11*)	–.08*	(–.06)	–.17*	(–.12*)	–.24*	(–.15*)
- Neuroticism	.75*		.06		.44*		.10*		.26*		.62*	
- Social Desirability	–.08*	(–.03)	.14*	(.13*)	–.03	(.03)	–.02	(.02)	–.22*	(–.22*)	–.06	(.01)

Notes. I = Worrying; II = Rigidity; III = Need for Approval; IV = Emotional Irresponsibility; V = Problem Avoidance; VI = Total IBI. Partial correlations are between brackets. $p < .05$.

differences. Worrying correlates at a lower level with Problem Avoidance and the Total scale and Rigidity has a lower coefficient with Problem Avoidance and Emotional Irresponsibility. By and large the results indicate that the subscales are quite independent from each other.

Correlations Between IBI and Other Measures

In Table 7 the Pearsonian correlations as well as partial correlations of the IBI-50 with other measures are given. When carrying out the partial correlations we controlled for Neuroticism. The results of this Study seem to cross-validate the outcome of Study 2, although there are some minor differences. The more exceptional differences when compared with Study 2 are: the correlations of the Rigidity-scale with Psychoticism (higher) and with Social Desirability (lower) and the correlation of the Total-scale with Severe Depression-scale of the GHQ (higher). In addition, the correlations of the SIB-scales with the IBI show medium-sized coefficients with Need for Approval, Worrying and the Total IBI-scale especially. Indicating that the subjects perceptions of their own social behaviour correlates with there cognitions which supports the validity.

Differences Between Men and Women

Significant differences between men and women were found on several scales (See Table 8). Women had a higher score on: Worrying, Need for Approval and on the Total scale, whereas men had a higher score on Rigidity. There is a marked difference with the mean-score on the Rigidity scale in Study 2, which is lower in the present Study. This seems to cross-validate the existence of a relationship between age and Rigidity, since the sample of Study 3 is much younger.

Concluding Remarks

The results of this Study are in line with Study 2 and therefore in support of the reliability and validity of the IBI. Some notable differences – for example

Table 8. T-tests between scores of men and women on all IBI scales (Study 3).

IBI-scale	Mean Women	Mean Men	Sd Women	Sd Men	T	df	p
Worrying	34.1	30.6	7.6	7.6	–5.24	526	.000
Rigidity	36.0	37.5	6.2	6.3	2.64	520	.008
Need Approval	22.1	20.6	4.9	5.0	–3.51	527	.000
Problem Avoidance	22.1	22.3	4.6	4.7	.55	525	n.s.
Emotional Irrespons.	22.7	22.0	4.3	4.7	–1.72	527	n.s
IBI-total	136.8	132.9	16.5	15.7	–2.65	509	.008

with the Rigidity scale – are presumably influenced by a difference in the sample (community vs student sample). Recently, we carried out a first study in the USA among students with the English version (See Appendix). The first results are promising and indicative for its cross-cultural invariance (Bridges and Sanderman, 1993).

General Discussion

The Irrational Beliefs Inventory (IBI-50) is a measure for establishing irrational belief systems. The original factor structures of the IBT and the RBI respectively are only partly approximated by the IBI. Half of the IBT factors (Anxious Overconcern, Blame Proneness, Problem Avoidance, Demand for Approval and Emotional Irresponsibility) and four of the eleven RBI factors (Catastrophizing, Guilt, Blame/Punishment and Inertia/Avoidance) are reasonably well represented by corresponding IBI subscales.

Our findings indicate that the irrational ideas as formulated by Ellis (1962) are not representing separate factors, because half of these ideas were not retrieved in the factor analysis. It is remarkable that many authors take these irrational ideas for granted without questioning them. This is by the way interesting, since questioning the validity of beliefs which one holds is so basic to Ellis his RET-therapy. Only a few studies investigated the internal structure of the instruments designed to measure these ideas, among which are the IBT and the RBI (Lohr & Bonge, 1982; Himle et al., 1985; Sanderman et al., 1987). Most studies only addressed the validity of these instruments without investigating the underlying structure. Several authors equally could not replicate the factor structures of the IBT and the RBI. Like Lohr and Bonge (1982), in the present study only about half of the items of the IBT subscales loaded highly on the matching factors in the IBI. In this Study none of the items of Control of Emotions of the RBI loaded high on the corresponding subscale Emotional Irresponsibility of the IBI. This result is in accordance with the results of Himle et al. (1985).

Factor analyses revealed a robust 5-factor solution. These scales did correlate lowly to moderately with each other. In both studies it was shown that anxiety related factors (Problem Avoidance, Worrying and Demand for Approval) were positively associated with each other.

The IBI-50 has a good internal consistency for the subscales as well as for the total scale. The reliability coefficient of the total test is comparable to those of the IBT and the RBI respectively.

The IBI has the advantage of being much shorter than the IBT.

Especially in clinical settings the length of the IBT appeared to be a drawback. The IBI means a psychometric improvement on the RBI since it contains more items in each subscale compared with the three or four items per subscale of the RBI.

The IBI satisfies most of the recommendations as formulated by Comrey (1988) with regard to scale length (sufficient number of items in a subscale), type of answer scale (at least five numerical response categories), and item stem composition (straight items and items stated in a negative direction to control for response tendencies).

It appears that some of the IBI scales as well as several measures of distress actually measure a more general dimension, previously labelled as Neuroticism or negative affect. Generally, apart from the Rigidity scale, results confirmed the relationships that were hypothesized to exist among the various scales. However, some correlations were found to be somewhat lower than was expected.

Depression, Anxiety and Neuroticism were found to be relatively strongly related to Worrying, Need for Approval and Problem Avoidance, thus corroborating results from studies with RBI and IBT scales (Nelson, 1977; Morelli & Andrews, 1980; Defenbacher, Zwemer, Whisman, Hill & Sloan, 1986.) Morelli and Andrews (1980) found Rigidity to be

positively related to Neuroticism. This relationship was not found in the present Study. "Expectations and demands with regard to social situations" seems to be relatively strongly related to Rigidity, whereas "Self-image and thoughts about own social functioning" appears not to be related to Rigidity. This could mean that unassertiveness is more related to rigid values and norms one holds about social functioning in general or about how one should behave in social situations, than to rigid values and norms one holds about one's own social functioning. Further unassertiveness appears to be moderately related to Worrying, Problem Avoidance and Need for Approval.

Somatisation seems to be related to Worrying, though this relationship was not found to be very strong. The other irrational beliefs were not found to be related to Somatisation.

The IBI-scale Emotional Irresponsibility was not found to be related to psychopathology. Cash (1984), McLennan (1987) and Nelson (1977) found that the IBT-scale Emotional Irresponsibility, which resembles the present Emotional Irresponsibility scale, does not have a relation with psychopathology (depression) either.

The total score of the IBI seems to be only slightly affected by social desirability. This is probably due to the relatively strong relationship between the IBI scale Rigidity and social desirability. A possible explanation for this relationship is that people who hold rigid values and norms for themselves and others want to show the best part of themselves, "as it is appropriate or as it should be".

Zurawski and Smith (1987) hypothesized that cognitive questionnaires, in particulary the IBT and the RBI measure dysphoria or Neuroticism instead of irrational cognitions related to psychopathology. Data from their Study revealed that the RBI and IBT are even more strongly correlated to each other than with measures of depression (.59 and .70) and anxiety (range .66–.77) respectively. Data from the present Study reveal that the IBI measures cognitions rather than anxiety or depression. The correlations between the IBI and the Anxiety scale and Depression scale of the GHQ appear to be rather moderate (r = .38 and r = .29 in Study 2 and r = .42 and r = .44 in Study 3 for anxiety and depression respectively).

The present Study shows that irrational thinking increases slightly with age, corroborating results of an earlier Study on the RBI (Sanderman et al., 1987). Further, results showed that women worry more, need more approval from others and see their emotions more externally controlled than men. Closer inspection of the results showed that the higher scores on Need for Approval and External Control can be ascribed to women aged 20 to 30. Jones (1968) found the same relationship between gender and Need for Approval. In Jones' Study, other scales did not seem to be affected by gender. Though the differences for men and women on several IBI-scales are statistically significant, the differences are very low, except for the IBI-scale Worrying.

It is important to note that correlations between IBI and other measures – when controlling for Neuroticism – decrease considerably. One might argue that these measures are therefore not useful. However, Neuroticism is widely accepted as one of the dimensions of "The Big Five" (cf. Costa & McCrae, 1992). In addition, certain "lower-order" factors are supposed to determine the "higher-order" factor Neuroticism. From the present results one may conclude that – at least for some scales – irrational beliefs can be interpreted as "lower-order" factors of Neuroticsm (Worrying, Need for Approval and Problem Avoidance). However, two scales are not related to Neuroticism (Rigidity and Emotional Irresponsibility). It is therefore useful to use these kind of dimensions of irrational beliefs instead of Neuroticism only, while it gives more information in which domain of Neuroticism problems arise and additionally it gives information on irrational cognitions outside the domain of Neuroticism.

In conclusion, the IBI-50 appears to have major advantages in comparison with the IBT and RBI. As has been mentioned, a study in the USA among students with the English version is supporting its cross-cultural invariance (Bridges and Sanderman, 1993). However, further research with other populations is needed. In addition, research involving clinical populations is recommended. One of the major issues for further research is whether the IBI is sensitive to cognitive changes in cognitive therapy.

Requests for reprints should be sent to:
Robbert Sanderman
Department of Health Sciences
University of Groningen,
A. Deusinglaan 1,
9713 AV Groningen
The Netherlands
E-mail: R.SANDERMAN@MED.RUG.NL

References

American Psychiatric Association. (1980). *Diagnostic and statistical manual of mental disorders* (3rd ed.). Washington, DC.

Arrindell, W.A., & Van der Ende, J. (1985) Cross-sample invariance of the structure of self-reported distress and difficulty in assertiveness. *Advances in Behaviour Research and Therapy, 7*, 205–243.

Arrindell, W.A., Sanderman, R., Hageman, W.J.J.M., Pickersgill, M.J., Kwee, M.G.T., Molen, H.T., van der & Lingsma, M.M. (1990) Correlates of assertiveness in normal and clinical samples: a multidimensional approach. *Advances in Behaviour Research and Therapy, 12*, 153–282.

Berge, J.M.F. Ten, (1986). Rotation to perfect congruence and the cross-validation of component weights across populations. *Multivariate Behavioral Research, 21*, 41–64.

Bridges, K.R. & Sanderman, R. (1993) *The Irrational Beliefs Inventory: a cross-cultural comparison between USA and The Netherlands.* Paper presented at the Congress of the American Psychological Association, Toronto, August 1993.

Camstra, H. (1985). *Pekon, een Pascal-programma voor CDC-computer (Cyber)* [PEKON, a Pascal program for CDC-computer (Cyber)]. University of Groningen, Groningen.

Cash, T.F. (1984). The Irrational Beliefs Test: Its relationship with cognitive-behavioral traits and depression. *Journal of Clinical Psychology, 40*, 1399–1405.

Comrey, A.L. (1988). Factor-analytic methods of scale development in personality and clinical psychology. *Journal of Consulting and Clinical Psychology, 56*, 754–761.

Costa, P.T. & McCrae, R.R. (1992) *Revised NEO Personality Inventory (NEO PI-R) and NEO Five Factor Inventory (NEO-FFI): Professional manual.* Odessa, FL: Psychological Assessment Resources, Inc.

Deffenbacher, J.L., Zwemer, W.A., Whisman, M.A., Hill, R.A. & Sloan, R.D. (1986). Irrational beliefs and anxiety. *Cognitive Therapy and Research, 3*, 281–292.

Ellis, A. (1962). *Reason and emotion in psychotherapy.* New York: Lyle-Stuart.

Eysenck, H.J. & Eysenck, M.W. (1975). *Manual of the Eysenck Personality Questionnaire.* London: Hodder & Stoughton.

Goldberg, D.P. & Williams, P. (1988). *A user's guide to the General Health Questionnaire.* Berkshire: NFER-NELSON.

Himle, D.P., Hnat, S., Thyer, B., & Papsdorf, J.D. (1985). Factor structure of the Rational Behaviour Inventory. *Journal of Clinical Psychology, 41*, 368–371.

Jones, R. (1968). A factored measure of Ellis' irrational beliefs system with personality maladjustment correlates. (Doctoral dissertation, Texas Technical College). *Dissertation Abstracts International, 29* (II-B), 4379–4380. (University Microfilms No. 69–6443, 1969).

Kamp, I. Van & Klip, E.C. (1981). Cognitieve aspecten van subassertief gedrag, "De constructie van een vragenlijst". *Gedragstherapeutisch Bulletin, 2*, 45–56.

Lohr, J.M., & Bonge, D. (1982). The factorial validity of the Irrational Beliefs Test: A psychometric investigation. *Cognitive Therapy and Research, 6*, 225–230.

McLennan, J.P. (1987). Irrational beliefs in relation to self-esteem and depression. *Journal of Clinical Psychology, 22*, 89–91.

Meijgaard, I. van, Tros, A., Molen H. van der & Wolters F. (1987). De Sociale Cognitielijst: Een nadere validatie. *De Psycholoog, 22*, 383–389.

Morelli, G. & Andrews, L. (1980). Rationality and its relations to extraversion and neuroticism. *Psychological Reports, 47*, 1111–1114.

Nelson, R.E. (1977). Irrational beliefs in depression. *Journal of Consulting and Clinical Psychology, 45*, 1190–1191.

Sanderman, R., & Stewart, R. (1990) The assessment of psychological distress: Psychometric properties of the General Health Questionnaire (GHQ). *International Journal of Health Sciences, 1*, 195–202.

Sanderman, R., Eysenck, S.B.G., & Arrindell, W.A. (1991). Cross-cultural comparisons of personality: The Netherlands and England. *Psychologcial Reports, 69*. 1091–1096.

Sanderman, R., Mersch, P.P., Sleen, J. van der, Emmelkamp, P.M.G., & Ormel, J. (1987). The Rational Behaviour Inventory (RBI): A psychometric evaluation. *Personality and Individual Differences, 8*, 561–569.

Shorkey, C.T., & Whiteman, V.L. (1977). Development of the Rational Behaviour Inventory: Initial validity and reliability. *Educational and Psychological Measurement, 37*, 527–534.

Zurawski, R.M. & Smith, T.W. (1987). Assessing irrational beliefs and emotional distress: Evidence and implications of limited discriminant validity. *Journal of Counseling Psychology, 34*, 224–227.

Appendix A. Irrational Beliefs Inventory

1. If I can't keep something from happening, I don't worry about it.
2. I worry a lot about certain things in the future.
3. Certain people are bad or wicked and should be severely punished for their sins.
4. People should observe moral laws more strictly than they do.
5. I want everyone to like me.
6. I often can't get my mind off some concern.
7. I tend to become terribly upset when things are not the way I would like them to be.
8. I am fairly easygoing about life.
9. Punishing oneself for all errors will prevent future mistakes.

atomic war.
11. I avoid facing my problems.
12. A person won't stay angry or blue long, unless he keeps himself that way.
13. I usually try to avoid chores which I dislike doing.
14. Those who do wrong deserve to be blamed.
15. If a person wants to, he can be happy under almost any circumstances.
16. I tend to worry about possible accidents and disasters.
17. Nothing is upsetting in itself— only in the way you interpret it.
18. A large number of people are guilty of bad sexual conduct.
19. I often get exited or upset when things go wrong.
20. It is sinful to doubt the Bible.
21. I often worry about how people approve of and accept me.
22. Sometimes I can't get a fear off my mind.
23. I hate to fail at anything.
24. The fear of punishment helps people to be good.
25. I shrink from facing a crisis or difficulty.
26. I feel little anxiety over unexpected danger or future events.
27. If something is necessary, I do it even if it is unpleasant.
28. Frustrations upset me.
29. One should blame oneself severely for all mistakes and wrongdoings.
30. People are disturbed not by situations but by the view they take of them.
31. I usually put off important decisions.
32. I get terribly upset and miserable when things are not the way I like them to be.
33. More people should face up to the unpleasantness of life.
34. Helping others is the very basis of life.
35. There is a right way to do everything.
36. It is difficult for me to do unpleasant chores.
37. It is important to me that others approve of me.
38. Too many evil persons escape the punishment they deserve.
39. It is realistic to expect that there should be no incompatibility in marriage.
40. I often spend more time trying to think of ways of getting out of things than it would take me to do them.
41. Immorality should be strongly punished.
42. There is never any reason to remain sorrowful for very long.
43. What others think of you is most important.
44. One should rebel against doing unpleasant things, however necessary, if doing them is unpleasant.
45. I can't stand to take chances.
46. Man makes his own hell within himself.
47. I dislike responsibility.
48. Although I like approval, it's not a real need for me.
49. People who are miserable have usually made themselves that way.
50. I have considerable concern with what people are feeling about me.

Note. In the studies described in this article a Dutch version of the questionnaire has been used. However, the above English version has been studied in the USA already (Bridges and Sanderman, 1993).

Score transformation of the Irrational Beliefs Inventory

The items are marked as following: 1 (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree), and 5 (strongly agree).

The following IBI-items 1, 8, 10, 12, 15, 17, 26, 27, 30, 42, 46, 48 and 49 are phrased in a rational direction. The scores on these items should be transformed in the opposite direction (1 = 5, 2 = 4, 3 = 3, 4 = 2, 5 = 1).

The subscale scores can be obtained by summation of the relevant items, which are:

1. Worrying	1 2 6 7 8 10 16 19 22 26 28 32
2. Rigidity	3 4 9 14 18 20 24 29 33 34 35 38 39 41
3. Problem Avoidance	11 13 25 27 31 36 40 44 45 47
4. Demand for Approval	5 21 23 37 43 48 50
5. Emotional Irresponsibility	12 15 17 30 42 46 49

The total score of the IBI can be obtained by summing across all items. A high score reflects irrationality.